3.2.2 Water Quality and Stormwater Runoff

This section describes the regulatory setting associated with water quality and stormwater runoff; the affected environment for water quality and stormwater runoff; the environmental consequences of the I-405 Improvement Project on water quality that would result from the project; and the water quality control measures (i.e., BMPs) that would minimize potential impacts. This section includes a range of topics related to water resources, including the regulatory setting, receiving water bodies, and water quality. Surface water resources are important for fish and wildlife habitat, urban and agricultural water supply, and conveying floodwaters. Groundwater is also an important source of urban and agricultural water supply. Additional information related to hydrology and floodplains, such as stream crossings, onsite and offsite drainage, and stormwater systems is included in Section 3.2.1, Hydrology and Floodplains.

3.2.2.1 Regulatory Setting

Federal Requirements: Clean Water Act

In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the U.S. from any point source[10] unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. This act and its amendments are known today as the Clean Water Act (CWA). Congress has amended the act several times. In the 1987 amendments, Congress directed dischargers of stormwater from municipal and industrial/construction point sources to comply with the NPDES permit scheme. The following are important CWA sections:

- Sections 303 and 304 require states to issue water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity that may result in a discharge to waters of the U.S. to obtain certification from the State that the discharge will comply with other provisions of the act. This is most frequently required in tandem with a Section 404 permit request (see below).
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. RWQCBs administer this permitting program in California. Section 402(p) requires permits for discharges of stormwater from industrial/construction and municipal separate storm sewer systems (MS4s).

[10] A point source is any discrete conveyance, such as a pipe or a man-made ditch.

- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the U.S. This permit program is administered by USACE.

The goal of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

USACE issues two types of 404 permits: Standard and General permits. There are two types of General permits: Regional permits and Nationwide permits. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Regional or Nationwide Permit may be permitted under one of USACE's Standard permits. There are two types of Standard permits: Individual permits and Letters of Permission. For Standard permits, the USACE decision to approve is based on compliance with EPA's Section 404 (b)(1) Guidelines (U.S. EPA CFR 40 Part 230) and whether permit approval is in the public interest. The Section 404(b)(1) Guidelines were developed by EPA in conjunction with USACE and allow the discharge of dredged or fill material into the aquatic system (i.e., waters of the U.S.) only if there is no practicable alternative that would have less adverse effects. The Guidelines state that USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S. and not have any other significant adverse environmental consequences. According to the Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent[11] standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the U.S. In addition, every permit from USACE, even if not subject to the Section 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4. A discussion of the LEDPA determination, if any, for the document is included in Section 3.3.2, Wetlands and Other Waters.

State Requirements: Porter-Cologne Water Quality Control Act

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This Act requires a "Report of Waste Discharge" for any discharge of waste (i.e., liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the State. It predates the CWA and regulates discharges to waters of

[11] EPA defines "effluent" as "wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall."

the State. Waters of the State include more than just Waters of the U.S., such as groundwater and surface waters not considered Waters of the U.S. Additionally, it prohibits discharges of "waste" as defined, and this definition is broader than the CWA definition of "pollutant." Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (i.e., objectives and beneficial uses) required by the CWA and regulating discharges to ensure compliance with the water quality standards. Details about water quality standards in a project area are included in the applicable RWQCB Basin Plan. In California, RWQCBs designate beneficial uses for all water body segments in their jurisdictions and then set criteria necessary to protect these uses. As a result, the water quality standards developed for particular water segments are based on the designated use and vary depending on that use. In addition, the SWRCB identifies waters failing to meet standards for specific pollutants. These waters are then state-listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source or non-point source controls (i.e., NPDES permits or WDRs), the CWA requires the establishment of Total Maximum Daily Loads (TMDLs). TMDLs specify allowable pollutant loads from all sources (i.e., point, non-point, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers water rights, sets water pollution control policy, and issues board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, TMDLs, and NPDES permits. RWQCBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

NPDES Program

Municipal Separate Storm Sewer Systems

Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of stormwater dischargers, including MS4s. An MS4 is defined as "any conveyance or system of conveyances (i.e., roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over stormwater, that is designed or used for collecting or conveying stormwater." The SWRCB has identified Caltrans as an owner/operator of an MS4 under federal regulations. Caltrans MS4 permit covers all Caltrans ROWs, properties, facilities,

and activities in the state. The SWRCB or the RWQCB issues NPDES permits for 5 years, and permit requirements remain active until a new permit has been adopted.

Caltrans MS4 Permit (Order No 2012-0011-DWQ) was adopted on September 19, 2012, and became effective on July 1, 2013. The permit has three basic requirements:

1. Caltrans must comply with the requirements of the Construction General Permit (CGP) (see below);
2. Caltrans must implement a year-round program in all parts of the State to effectively control stormwater and nonstormwater discharges; and
3. Caltrans stormwater discharges must meet water quality standards through implementation of permanent and temporary (construction) BMPs, to the Maximum Extent Practicable, and other measures as the SWRCB determines to be necessary to meet the water quality standards.

To comply with the permit, Caltrans developed the Statewide Storm Water Management Plan (SWMP) to address stormwater pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP assigns responsibilities within Caltrans for implementing stormwater management procedures and practices, as well as training, public education and participation, monitoring and research, program evaluation, and reporting activities. The SWMP describes the minimum procedures and practices Caltrans uses to reduce pollutants in stormwater and nonstormwater discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of BMPs. The proposed project will be programmed to follow the guidelines and procedures outlined in the latest SWMP to address stormwater runoff.

Construction General Permit

The CGP (Order No. 2009-009-DWQ), adopted on September 2, 2009, became effective on July 1, 2010. The permit regulates stormwater discharges from construction sites that result in a Disturbed Soil Area (DSA) of 1-acre or greater and/or are smaller sites that are part of a larger common plan of development. By law, all stormwater discharges associated with construction activity where clearing, grading, and excavation result in soil disturbance of at least 1-acre must comply with the provisions of the CGP. Construction activity that results in soil disturbances of less than 1-acre is subject to this CGP if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction sites are required to develop Storm Water Pollution Prevention Plans (SWPPP); to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the CGP.

The 2009 CGP separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases, and they are based on potential erosion and transport to receiving waters. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory stormwater runoff pH and turbidity monitoring, and before construction and after construction aquatic biological assessments during specified seasonal windows. For all projects subject to the permit, applicants are required to develop and implement an effective SWPPP. In accordance with Caltrans Standard Specifications, a Water Pollution Control Plan (WPCP) is necessary for projects with DSA less than 1-acre.

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to waters of the U.S. must obtain a 401 Certification, which certifies that the project will be in compliance with State water quality standards. The most common federal permits triggering 401 Certification are CWA Section 404 permits issued by USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before USACE issues a 404 permit.

In some cases, the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as WDRs under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

Dewatering Activities

Care is required for the removal of nuisance water from a construction site (known as dewatering) because of the high turbidity and other pollutants associated with this activity. Santa Ana RWQCB's Order No. R8-2009-0003 NPDES NO.CAG998001, General Waste Discharge Requirements for Discharges to Surface Water which Pose an Insignificant *(de Minimis)* Threat to Water Quality[12] covers discharges to surface water from dewatering activities.

3.2.2.2 Affected Environment

This water quality analysis is based upon the Final Water Resources and Water Quality Technical Report, which was a separate technical study prepared for this project (April 2011).

[12] California RWQCB Santa Ana Region Order No. R8-2009-0003R8-2009-0003R8-2009-0003, Amending Order No. R8-2003-0061, NPDES No. CAS998001 as Amended by Order No. R8-2005-0041 General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant *(de Minimis)* Threat to Water Quality.

The proposed project spans approximately 16 miles between SR-73 PM 9.3 and I-605 PM 24.2. The project corridor is located within a fully built environment within an area predominated by impervious surface. The corridor runs through an area characterized by commercial and light industrial facilities and mostly single-family residences separated from the freeway by soundwalls. Drainage ditches run parallel to the freeway for most of its alignment on the corridor (Group Delta Consultants 2010a). The proposed project is located within the East Coastal Plain HSA (HSA 801.11) and the Anaheim HSA Split (HSA 845.61), and traverses three watersheds, which are the Santa Ana River Watershed, the Anaheim Bay-Huntington Harbour Watershed, and the San Gabriel River-Coyote Creek Watershed (Figure 3.2.2-1).[13] Although the project area extends into the Newport Bay Watershed, there are no soil-disturbing activities, and no additional impervious surface area is proposed within this watershed; therefore, no water quality impacts would occur in the Newport Bay Watershed as a result of this project, and consequently, impacts to the Newport Bay Watershed are not addressed in this report.

Reach 1 of the Santa Ana River serves as the main tributary to HSA 801.11A. Within the proposed project limits, offsite flow is directed to many engineered, concrete-lined channels. Flow within these channels ultimately drains to Reach 1 of the Santa Ana River. Within the proposed project limits, Reach 1 of the Santa Ana River is conveyed within a concrete-lined rectangular channel with a central low-flow channel under I-405. Reach 1 is a normally dry flood control facility and extends from 17th Street to the tidal prism at the Pacific Ocean (Santa Ana RWQCB 1995).

Offsite flows within HSA 845.61 from the proposed project limits would be conveyed to many engineered channels. These channels are described in Section 3.2.1, Hydrology and Floodplains, and include the Bolsa Chica Channel, the Federal Storm Channel, the Bixby Storm Channel, and the Montecito Storm Channel. Coyote Creek serves as the sole tributary within HSA 845.61 and is outside of the proposed project limits.

The climate in the project area is classified as Mediterranean, characterized by warm, dry summers and mild, wet winters. The major contributors to the climate are the Eastern Pacific High Pressure Area and the moderating effects of the Pacific Ocean. The mean high winter temperature is 65 degrees Fahrenheit (°F), and the mean high summer temperature is 77°F. The current rainy season in the project area, as defined by the Santa Ana RWQCB, is from October 1 through May 1; however, most rainfall occurs during the winter season, which is December through February. The annual average rainfall within HSAs 801.11 and 845.61 is approximately 13 inches (Parsons 2011j).

[13] Source: Santa Ana RWQCB. Accessed February 2, 2011. http://www.waterboards.ca.gov/santaana/water_issues/programs/stormwater/docs/sbpermit/forms/region8_hydrologic_areas.pdf

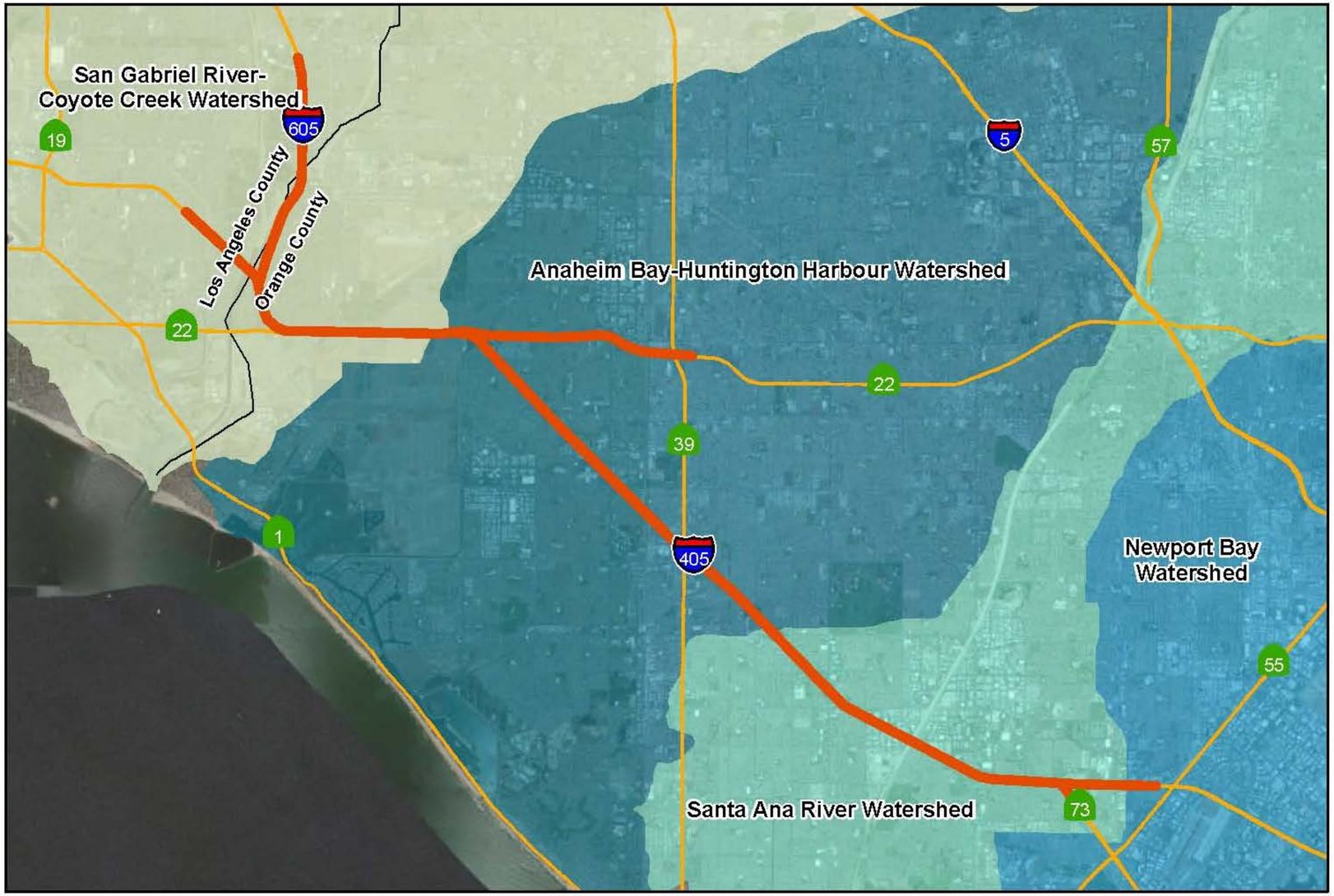


Figure 3.2.2-1: Hydrologic Subareas within the I-405 Improvement Project Corridor

This page intentionally left blank.

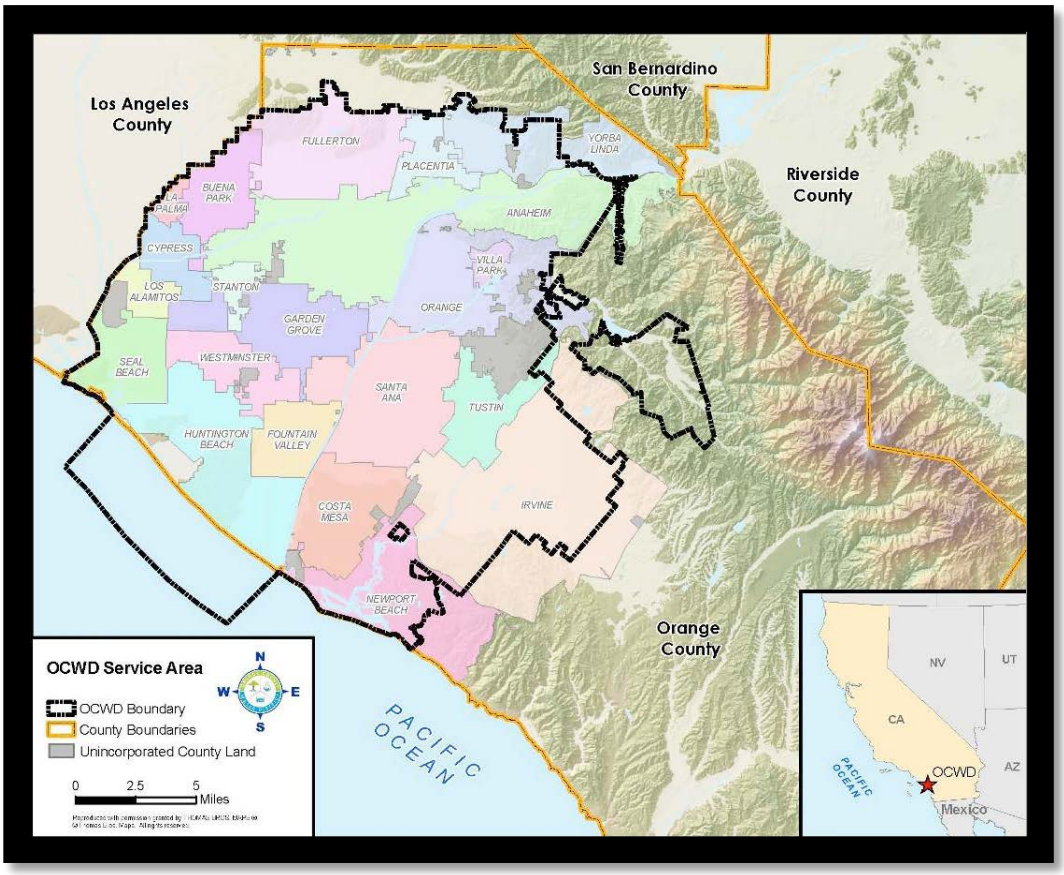
Hydrologic Units

The Santa Ana RWQCB Region encompasses parts of southwestern San Bernardino County, western Riverside County, and northwestern Orange County. This region is divided into three major hydrologic units (HUs), 12 hydrologic areas (HAs), and 56 HSAs. HUs are the entire watershed of one or more streams; HAs are major tributaries and/or major groundwater basins within the HU; and HSAs are major subdivisions of HAs and include water-bearing and nonwater-bearing formations. The project limits cross two of the three HUs within the Santa Ana RWQCB – the Santa Ana River HU and the Los Angeles-San Gabriel River HU.

East Coastal Plain HSA (HSA 801.11)

The East Coastal Plain HSA is within the Santa Ana River HU and the Lower Santa Ana River HA. At approximately 304 square mi, this HSA is the larger of the two HSAs within the project limits. The proposed project falls mainly within this HSA, where the southern project limit begins near the middle of the HSA and extends to the northern boundary of the HSA where I-405 meets SR-22 East. Reach 1 of the Santa Ana River serves as the main tributary to this HSA. Reach 1 is a normally dry flood control facility and extends from 17th Street to the tidal prism at the Pacific Ocean (Santa Ana RWQCB 1995). Within the project limits, the Santa Ana River is conveyed within a concrete-lined rectangular channel with a central low-flow channel under I-405. The channel is approximately 240 ft wide with vertical walls approximately 23 ft in height. The bridge over the Santa Ana River is supported by three pier walls on spread footings and concrete piles (Parsons 2010j).

The proposed project is located over the Orange County Groundwater Basin, as shown in Figure 3.2.2-2. The basin underlies the northern half of Orange County, including the study area, and lies within the Orange Groundwater Management Zone in HSA 801.11. The entire basin covers approximately 350 square mi. It is bordered by Coyote and Chino hills to the north, the Santa Ana Mountains to the northeast, the Pacific Ocean to the southwest, and terminates near the Orange County line to the northwest (Figure 3.2.2-2). The California Department of Water Resources divides the Orange County Groundwater Basin into two hydrologic divisions – the Forebay Area and the Pressure Area. Most of the central and coastal portions of the basin fall within the Pressure Area, including Garden Grove (western half), Westminster, Seal Beach, Rossmoor, and Los Alamitos. The proposed project is within the Pressure Area (OCWD 2009).



Source: OCWD 2009.

Figure 3.2.2-2: Orange County Groundwater Basin

Anaheim Hydrologic Subarea Split (HSA 845.61)[14]

The Anaheim HSA Split is within the Los Angeles-San Gabriel River HU and the Anaheim HA Split (Santa Ana RWQCB 1995). The proposed project traverses the Anaheim HSA Split from the point where I-405 meets SR-22 East to the point where the project terminates at I-605. This HSA covers approximately 64 square mi and receives approximately 13.4 inches of rain on an annual basis. Coyote Creek, which serves as the sole tributary within this HSA, flows from Riverside County, empties into the San Gabriel River, and is located outside of the project limits.

Existing Water Quality

To evaluate existing water quality, Caltrans has conducted runoff monitoring and characterization studies from a range of transportation facilities throughout California. The monitoring has various objectives, such as complying with the NPDES permit requirements; producing representative

[14] Listed as undefined in the Office of Water Program's Water Quality Planning Tool (http://www.water-programs.com/wqpt.htm).

and scientifically credible runoff data from Department facilities; and providing useful information to facilitate Caltrans stormwater management strategies. These studies, which are available at, http://www.dot.ca.gov/hq/env/stormwater/special/newsetup/index.htm, indicate that water quality is influenced by several environmental, as well as site-specific, factors. These factors include traffic levels, cumulative seasonal precipitation, antecedent dry periods, total event rainfall, maximum rainfall intensity, drainage area, and impervious surface area.

Beneficial Uses

The Basin Plan for the Santa Ana Region has defined separate beneficial uses for inland surface streams, coastal waters, wetlands, and groundwater (Santa Ana RWQCB 1995). The Santa Ana RWQCB defines beneficial uses as one of the various ways that water can be used for the benefit of people and/or wildlife. The CWA defines water quality standards as both beneficial uses of specific water bodies and the levels of quality that must be met and maintained to protect those uses. The California Water Code directs each RWQCB to establish water quality objectives that will ensure the reasonable protection of beneficial uses and the prevention of nuisance.

The beneficial uses for water bodies within the project limits are displayed in Tables 3.2.2-1 and 3.2.2-2. These tables list beneficial uses for inland surface streams and groundwater management zones, respectively.

Table 3.2.2-1: Beneficial Uses of Santa Ana River (Reach 1)

Water Body	Beneficial Use[a]	Definition
Santa Ana River (Reach 1) HSA 801.11	Municipal and Domestic Supply[b]	Waters are used for community, military, municipal, or individual water supply systems. These uses may include, but are not limited to, drinking water supply.
	Body Contact Recreation[c]	Recreational activities involving body contact with water.
	Non-body Contact Recreation	Recreational activities involving proximity to water, but generally no body contact or ingestion of water.
	Warm Freshwater Habitat	Maintenance of warm water ecosystems.
	Wildlife Habitat	Uses of water that supports terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

[a] Beneficial use is existing unless otherwise noted.

[b] Exempted by the RWQCB from the municipal use designation per State Board Resolution No. 88-63, Sources of Drinking Water Policy.

[c] Access prohibited in all or part by Orange County RDMD.

Source: SARWQCB 1995.

Table 3.2.2-2: Beneficial Uses of the Orange Groundwater Management Zone

Water Body	Beneficial Use[a]	Definition
Orange Groundwater Management Zone HSA 801.11	Municipal and Domestic Supply	Waters are used for community, military, municipal, or individual water supply systems. These uses may include, but are not limited to, drinking water supply.
	Agricultural Supply	Waters are used for farming, horticulture, or ranching.
	Industrial Service Supply	Waters are used for industrial activities that do not depend primarily on water quality.
	Warm Freshwater Habitat	Waters support warm water ecosystems. These uses may include, but are not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.

[a] Beneficial use is existing unless otherwise noted.

Source: SARWQCB 1995, updated February 2008.

Section 303(d) of the Clean Water Act

The CWA requires states to identify water bodies that are considered *impaired*, which means the water body does not meet water quality standards. States must then place these water bodies onto a list, referred to as the "Clean Water Act Section 303(d) List of Water Quality Limited Segments." On August 4, 2010, the SWRCB approved the California 2010 Integrated Report. This report includes a combined list of CWA Section 303(d) water bodies that are listed as not meeting water quality standards and Section 305(b) water bodies, which identifies water bodies still requiring development of a TMDL, those that have a completed TMDL approved by EPA, and those that are being addressed by actions other than a TMDL.

Total Maximum Daily Loads

Once a water body is placed on the Section 303(d) List of Water Quality Limited Segments, the State is required to develop a TMDL to address each pollutant causing the impairment. A TMDL defines how much of a pollutant load a water body can tolerate and still meet water quality standards. The TMDL is required to account for contributions from point sources (i.e., permitted discharges), as well as contributions from nonpoint sources, including natural background. TMDLs allocate allowable pollutant loads for each source and identify management measures that, when implemented, will assure that water quality standards are attained. TMDLs, along with their associated implementation plans, are adopted into an RWQCB's Basin Plan through the Basin Planning process (Santa Ana RWQCB 2010).

Of the 23 TMDLs that have been established for receiving water bodies within HSA 801.11 and HSA 845.61, none are associated with Reach 1 of the Santa Ana River.

3.2.2.3 Environmental Consequences

Permanent Impacts (Long Term Impacts during Operation)

This project is located within two HSAs – the East Coastal Plain HSA (801.11) and the Anaheim HSA (845.61). Within these two HSAs, the Caltrans Water Quality Planning Tool has identified four Targeted Design Constituents (TDCs) for water bodies that are well outside the project limits but ultimately receive runoff from the proposed project. The TDCs and their associated water bodies are as follows: Bolsa Chica State Beach, with copper as the TDC; Huntington Harbour with copper, lead (Pb), and sediment as the TDCs; and the San Gabriel River Estuary, with copper as the TDC. Therefore, copper, Pb, and sediment are the TDCs identified for this project. Although the project would not be directly discharging to the San Gabriel River Estuary, a portion of the project area drains to the Bixby Storm Channel, which eventually leads to the San Gabriel River. From there, water is conveyed to the San Gabriel River Estuary.

The existing impervious surface within the project limits of Alternatives 1 and 2 is estimated to be 378 acres. The existing impervious surface within the project limits of Alternative 3 is estimated to be 468 acres. It should be noted that the project footprint for Alternative 3 is larger than the footprint for Alternatives 1 and 2; therefore, Alternative 3 has a greater amount of existing impervious surface area. The amount of additional impervious surface area that would be added by each of the proposed alternatives is provided below in Table 3.2.2-3.

Table 3.2.2-3: Impervious Surface Area Values by Alternative

Alternative	Existing Impervious Surface Area (acres)	Proposed Additional Impervious Surface Area (acres)	Total Impervious Surface Area (acres)	Percentage of Additional Impervious Surface Area (%)
No Build Alternative	378-468*	0	378-468*	0
Alternative 1	378	86	464	18
Alternative 2	378	99	477	21
Alternative 3	468	104	572	18

* Because the amount of existing impervious surface area for the Build Alternatives ranges from 378 to 468 acres, the amount of existing impervious surface area for the No Build Alternative will have the same range in values in comparison to the build alternatives.

With the increase in impervious surface area associated with each of the build alternatives, the chance for additional roadway pollutants to be discharged to the receiving water also increases. Additionally, the increased runoff generated from the additional impervious surface may increase the potential for erosion downstream.

Preliminary engineering has indicated that the proposed project may present opportunities for implementation of Treatment BMPs. All nine Caltrans-approved Treatment BMPs have been analyzed to determine their feasibility for implementation on the proposed project, and a final Treatment BMP strategy would be determined at the Plans, Specifications, and Estimates (PS&E) phase. Treatment BMPs would be selected based on their ability to treat the TDCs (i.e., copper, Pb, and sediment) and meet the feasibility and site criteria identified in the Project Planning and Design Guide (PPDG) (Caltrans July 2010). In accordance with PPDG guidelines, a Treatment BMP strategy has been developed for the Project Approval and Environmental Document (PA/ED) phase of this project. It should be noted that the PA/ED Treatment BMP strategy was based on the alternative with the largest project footprint, which is Alternative 3. It is anticipated that the same Treatment BMP strategy would be feasible to implement for Alternatives 1 and 2. The preliminary Treatment BMP strategy identified for Alternative 3 proposes 21 biofiltration swales and 13 water quality volume (WQV)-based Treatment BMPs (e.g., detention devices, infiltration devices, media filters, or any combination thereof). The proposed locations of these preliminary Treatment BMPs for Alternative 3 can be found in Appendix Q, Treatment Layout Sheets. The proposed Treatment BMP strategy is estimated to treat 29 percent of the total onsite runoff (from both proposed and existing paved surfaces within Caltrans ROW) WQV. It should be noted that the proposed Permanent Treatment BMP strategy is estimated to not only treat 100 percent of the net new impervious surface area proposed by this project, but will also treat additional runoff from approximately 60 acres of impervious surface. The inclusion of proposed treatment for previously untreated water will have a net benefit to water quality when compared to the No Build Alternative.

Treatment BMPs help to control runoff velocity and, in turn, can minimize the potential for downstream erosion; therefore, with implementation of Treatment BMPs, operation of the proposed project would not substantially degrade water quality, nor would it violate any water quality standard or waste discharge requirements. Under the No Build Alternative, runoff would continue to flow, untreated, into existing drainage facilities. The increased traffic that would result from the No Build Alternative could increase the amount of pollutants deposited on roadway surfaces and potentially increase the impacts to water quality.

Operation of the proposed project would not utilize groundwater for any purposes. This project would not deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level; therefore, the proposed project would not have significant and/or adverse effects to groundwater resources. It should be noted that because Treatment BMPs are being proposed on this project, there is a possibility that infiltration may be increased as a result of implementing

these devices. During final design, soil testing will be performed to determine the feasibility of implementing Treatment BMPs with infiltration capabilities. If it is determined that infiltration is feasible, then groundwater recharge would increase as a result of implementing the proposed project.

Erosion and siltation are not expected to increase substantially after construction because all of the disturbed slopes would be stabilized, and surface water from the project site would be diverted to designed collection facilities along the roadway. Risks due to erosion or washout would be minimized through the use of erosion control measures such as hydroseeding, groundcover, and mulch. Velocity dissipation devices, flared end outlets, headwalls, transition structures, and splash walls would be incorporated into the design where necessary at culvert inlets and outlets to prevent erosion. Ditches would be modified and box culverts would be extended to help intercept sheet flow where necessary and to convey runoff to facilities that cross under the roadway. The project design has considered minimizing the footprint and closely matching the existing grading to preserve as much of the existing vegetation as possible. The measures identified above would help to prevent the alteration of the existing drainage pattern of the area such that substantial erosion, sedimentation, or flooding within or downstream of the proposed project area is minimized.

With the addition of impervious surface area, the proposed project is anticipated to increase the volume of downstream flow. Because Alternatives 1 and 2 have different project limits than Alternative 3, the existing paved surface area varies depending on which alternative is identified. The existing impervious surface within the project limits of Alternatives 1 and 2 is estimated to be 378 acres. The existing impervious surface within the project limits of Alternative 3 is estimated to be 468 acres. The amount of additional impervious surface area that would be added by the build alternatives varies depending upon which alternative is identified. Alternative 1 would result in an additional 86 acres of impervious surface area, while Alternative 2 would result in an additional 99 acres of impervious surface area and Alternative 3 would result in an additional 104 acres of impervious surface area. Because each of the build alternatives would add additional acres of paved surface area, the velocity and volume of downstream flow is expected to increase. Alternative 3 would have the largest increase in runoff and pollutant loading, followed by Alternatives 2 and 3, respectively. Under the No Build Alternative, there would be no increase in runoff and/or pollutant loading. As previously mentioned, the total area for each of the watersheds that the proposed project traverses are as follows: Santa Ana River Watershed has an area of 210.5 square miles; Anaheim Bay-Huntington Harbour Watershed has an area of 80.4 square miles; and San Gabriel River-Coyote Creek Watershed has an area of 85.5 square miles. Because the total area of these three watersheds is 376.4 square miles, or 240,895

acres, the 86- to 104-acre increase in impervious surface area makes up approximately 0.04 percent of the area within the watersheds. This can be expected to translate into minor localized increases in urban runoff within the storm drain system. Under the No Build Alternative, there would be no increase in impervious surface area and no associated increase in flow.

The proposed project would also implement Design Pollution Prevention BMPs, which are source control BMPs used to prevent pollutants from entering stormwater. Design Pollution Prevention BMPs, such as permanent soil stabilization, hard surfaces, velocity dissipation devices, concentrated flow conveyance systems, and others, would be implemented to reduce pollutant discharges to the maximum extent practicable (MEP) requirements. All transitions between culvert outlets, headwalls, wingwalls, and channels would be smoothed to reduce turbulence and scour. Offsite runoff would be handled by allowing flows to pass under or around the proposed facility, and the existing drainage pattern would not be altered. Where possible, the runoff from all bridges would be conveyed to Treatment BMPs and no bridge runoff would be directly discharged into waterways. The preservation of existing vegetation would be maximized to reduce the amount of clearing and grubbing that would be required on slopes. In an effort to reduce concentrated flows, benches or terraces were provided during original construction on high cut and fill slopes, and slopes would be rounded or shaped accordingly. All of the new slopes would be flatter than 2:1 (horizontal:vertical). Disturbed slopes shall be revegetated per the Erosion Control Plan (approved by the District Landscape Architect).

There would be several culvert and bridge widening improvements required for this project. Most of the bridge work would require only minor channel modifications and would not affect their ability to convey flow. Culverts would have to be extended to the new embankments. There are several roadside ditches parallel to I-405 that would require pipe replacements. Due to the proposed widening and ROW constraints, replacing the ditches with pipe conduits would be necessary. During final design, a hydrology and hydraulic study shall be completed for these facilities. Hydraulic modeling was developed for some of the larger channels to compare the existing and proposed conditions. For other channels, sound engineering judgment based upon similar type work was utilized to determine that the proposed project would not create or contribute runoff that would exceed the capacity of existing or planned stormwater drainage systems.

The Caltrans SWMP describes BMPs and practices to reduce the discharge of pollutants associated with the operation of State highways, facilities, and activities. Spills from maintenance vehicles would be handled in accordance with the Caltrans SWMP Maintenance BMPs (Category IA).

This project would not discharge to unlined channels. Because of the lag time between the peak runoff from the receiving water bodies and that from the freeway runoff, the peak flow from I-405 would have substantially subsided by the time the watershed peak occurs. Existing drainage patterns would not be substantially altered; therefore, the proposed project would not have significant and/or adverse effects to the existing drainage pattern as a result of operations. Under the No Build Alternative, there would be no impacts to the existing drainage pattern.

As identified in Section 3.2.1, FEMA has identified flood zones on the FIRMs within the project area. Flood control facilities would require lengthening of cross culverts at numerous locations, along with bridge widening at major tributaries. Coordination with OCFCD and Caltrans is critical because these washes carry a significant amount of flow. Existing studies, as well as any future studies, would have to be examined to ensure that peak flows are being conveyed. Coordination is also necessary with USACE for the Santa Ana River.

There are areas where embankments would have to be regraded to accommodate the roadway widening. Channels, transition structures, slope stabilizers, headwalls, and wing walls would require reconstruction. Hydraulic studies for the channels and culvert analysis would be necessary to ensure that freeboard, headwater, and tailwater requirements are met. With the measures described above, implementation of the proposed project would not place structures in the 100-year flood hazard area that would pose a significant risk of loss, injury, or death involving flooding. Under the No Build Alternative, there would be no structures placed in the 100-year flood hazard area, and there would be no significant risk of loss, injury, or death involving flooding.

Temporary Impacts (Short Term Impacts during Construction)

The greatest potential for water quality impacts from the proposed project would be during construction. The total DSA anticipated for this project varies depending on which alternative is identified. Table 3.2.2-4 shows the total DSA for each of the proposed alternatives.

Table 3.2.2-4: Disturbed Soil Area by Alternative

Alternative	Estimated Disturbed Soil Area (acres)
No Build Alternative	0
Alternative 1	355
Alternative 2	384
Alternative 3	432

Section 2.2.2.1, Common Design Features of the Build Alternatives, identified several engineering features of the proposed project that have the potential to degrade water quality. More specifically, each of the build alternatives would require new structures; structure replacements; structural widening; box culvert replacements and extensions; soundwall construction; and retaining wall construction. Additionally, the roadway widening and median paving would increase onsite runoff, and it is anticipated that existing storm drain inlets would need to be modified and additional inlets may have to be added. To address temporary impacts, the project will comply with the NPDES CGP, which includes the preparation and implementation of a SWPPP that identifies Construction Site BMPs. With the preparation and implementation of a SWPPP, as described in the Caltrans Storm Water Quality Handbooks, Construction Site BMP Manual (Caltrans 2003b), no water quality standards or WDRs would be violated; therefore, construction of any of the build alternatives of the proposed project is not expected to substantially degrade water quality within the Santa Ana River Watershed, the Anaheim Bay-Huntington Harbour Watershed, or the San Gabriel River-Coyote Creek Watershed. Under the No Build Alternative, there would be no DSAs, and there would be no associated water quality degradation.

Based on the construction details described above, dewatering is anticipated for this project. Groundwater dewatering discharge could adversely impact surface water quality if effluent that is rich in sediment or contaminated with chemicals is not managed properly. Extracted groundwater may contain pollutants that may be a result of the decomposition of organic materials (e.g., hydrogen sulfide), leaking underground storage tanks (LUSTs) and fuel lines, surface spills, sewage, past use of liquid waste impoundments, or the potential presence of nutrients (i.e., phosphorous and nitrogen compounds). Dewatering may be necessary during excavation for the ramps or where new footings would be required. Results from soil boring samples would determine if dewatering is required for other areas within the proposed project limits.

Currently, discharges of groundwater from construction and project dewatering to surface waters within the project limits must comply with Waste Discharge Requirements issued by the Santa Ana RWQCB for dewatering activities (Order No. R8-2009-0003). Discharges covered by this permit include, but are not limited to, treated or untreated groundwater generated from permanent or temporary dewatering operations. In addition, this permit covers discharge from cleanup of contaminated sites where other project-specific General Permits may not be appropriate, such as groundwater impacted by metals and/or other toxic compounds. This permit also covers discharges from dewatering operations near creeks where surface waters and groundwaters are hydrologically connected and have similar water chemistry. Because all

dewatering operations that may be necessary as a result of implementing the build alternatives of the proposed project would need to comply with Order No. R8-2009-0003 NPDES NO. CAG998001, no impacts to surface water quality resulting from dewatering activities are expected. Furthermore, because the build alternatives for the proposed project would not utilize groundwater for any purposes, and no runoff would be infiltrated into groundwater basins, no impacts to groundwater quality are expected. Under the No Build Alternative, there would be no impacts to groundwater resources.

Erosion within the project limits has not been a concern given that the project corridor is located within a fully built environment within an area predominated by impervious surface, and runoff is conveyed to designed drainages throughout the alignment; however, erosion and siltation in the drainage area would be increased during construction of the proposed project. To minimize the potential for erosion and siltation that could result from construction of the proposed project, a combination of soil stabilization BMPs, sediment control BMPS, tracking control BMPs, and wind erosion control BMPs would be implemented. Examples of Construction Site BMPs that are anticipated to be implemented on this project are temporary silt fence, temporary fiber rolls, hydroseeding, street sweeping, and temporary cover. A final determination of the Construction Site BMP strategy will be determined at the PS&E phase.

During construction, the amount of sediments entering the receiving waters in the project area would be minimal with implementation of a project-specific SWPPP, which would include implementation of Construction Site BMPs. Proposed construction activities would involve stockpiling, grading, excavation, dredging, paving, and other earth-disturbing activities resulting in the alteration of existing drainage patterns. These types of activities would constitute a temporary alteration of drainage patterns. The project-specific SWPPP would include BMPs designed to minimize stormwater and erosional impacts during construction by implementing BMPs such as temporary silt fence, temporary fiber rolls, hydroseeding, street sweeping, and temporary cover. Compliance with the CGP would minimize the potential for construction activities to alter natural drainages via deposition of sediments; therefore, compliance with the CGP would reduce the risk of short-term erosion resulting from drainage alterations during construction to a less than significant impact. Under the No Build Alternative, there would be no soil disturbing activities, and no associated erosion.

3.2.2.4 Avoidance, Minimization, and/or Mitigation Measures

Best Management Practices

Caltrans has developed a SWMP that describes the procedures used to reduce or minimize the discharge of pollutants associated with the stormwater drainage systems that serve highways and

highway-related properties, facilities, and activities. Section 3 of the Statewide SWMP describes BMP categories that are used by Caltrans to meet the MEP and best conventional technology/ best available technology (BCT/BAT) requirements and to address compliance with water quality standards. Three general categories of BMPs have been identified for use in the Statewide SWMP:

- **Category I BMPs:** Technology-based pollution prevention controls to meet the MEP requirements for designing and maintaining roadways and related facilities.
  - Group A: Maintenance BMPs

    BMPs applicable to all maintenance operations. Examples of Maintenance BMPs include litter pickup, vegetation maintenance, and street sweeping.
  - Group B: Design Pollution Prevention BMPs

    BMPs applicable to the design of new facilities or major renovations of existing facilities. Examples of Design Pollution Prevention BMPs include flared culvert end sections, channel lining, and velocity dissipation devices.
- **Category II BMPs:** Temporary Construction Site BMPs to meet BCT/BAT requirements for construction projects that disturb 5 or more acres. (These BMPs are also applied to sites smaller than 5 acres.) Examples of Construction Site BMPs include silt fence, storm drain inlet protection, and stabilized construction entrance/exit.
- **Category III BMPs:** Treatment BMPs to meet MEP requirements. Treatment BMPs are permanent treatment devices and facilities. Examples of Treatment BMPs include biofiltration strips/swales, detention devices, infiltration basins, and media filters.

Construction Phase (Short Term)

The Contractor shall conform to current federal, State, and local regulatory requirements to minimize impacts to water resources and water quality, including:

WQ-1: Conforming to the requirements of the Caltrans Statewide NPDES Storm Water Permit, Order No. 2012-0011-DWQ, NPDES No. CAS000003, adopted by the SWRCB on September 19, 2012, in addition to the BMPs specified in the Caltrans SWMP (Caltrans 2003a). The Contractor shall also conform to the requirements of the General NPDES Permit for Construction Activities, Order No. 2009-0009-DWQ, NPDES No. CAS000002 and any subsequent permit in effect at the time of construction.

WQ-2: Preparing and implementing the SWPPP. The SWPPP shall address all State and federal water control requirements and regulations. The SWPPP shall address all construction-related activities, equipment, and materials that have the potential to impact water quality. All Construction Site BMPs will follow the latest edition of the Storm Water Quality Handbooks, Construction Site BMP Manual to control and minimize the impacts of construction-related pollutants. The SWPPP shall include BMPs to control pollutants, sediment from erosion, stormwater runoff, and other construction-related impacts. In addition, the SWPPP shall include implementation of specific stormwater effluent monitoring requirements based on the project's risk level to ensure that the implemented BMPs are effective in preventing the exceedance of any water quality standards.

All work will conform to the Construction Site BMP (Category II) requirements specified in the latest edition of the Caltrans SWMP to control and minimize the impacts of construction and construction-related activities, materials, and pollutants on the watershed(s). These include, but are not limited to, temporary sediment control, temporary soil stabilization, scheduling, waste management, materials handling, and other nonstormwater BMPs. For a complete list, refer to Section 4.5 of the Caltrans SWMP (2003a).

WQ-3: Dewatering is anticipated for the proposed project; therefore, this project will fully conform to Order No. R8-2009-0003 NPDES No. CAG998001, *General Waste Discharge Requirements for Discharges to Surface Water which Pose an Insignificant (De Minimis) Threat to Water Quality*, from the Santa Ana RWQCB. Dewatering BMPs will be used to control sediments and pollutants. A laboratory, certified under either the Environmental Laboratory Accreditation Program or the National Environmental Laboratory Accreditation Program, will test and monitor any discharge for compliance with RWQCB requirements.

Post-Construction Period (Long Term)

The Caltrans SWMP describes BMPs and practices to reduce the discharge of pollutants associated with the stormwater drainage systems of State highways, facilities, and activities. The completed project plans will incorporate all necessary Maintenance BMPs (Category IA), Design Pollution Prevention BMPs (Category IB), and Treatment BMPs (Category III) to meet the MEP requirements. A combination of BMPs from the following categories will be implemented as part of the proposed project:

WQ-4: Maintenance BMPs – Maintenance BMPs will be adhered to in accordance with Caltrans policies, including routine maintenance work, such as litter pickup, toxics control, street sweeping, drainage, and channel cleaning.

WQ-5: Design Pollution Prevention BMPs – Permanent soil stabilization systems will be incorporated into project design, such as preservation of existing vegetation, concentrated flow conveyance systems (e.g., drainage ditches, dikes, berms, swales), and slope/surface protection systems that utilize either vegetated or hard surfaces. Identification of Design Pollution Prevention BMPs will occur during final design.

WQ-6: Treatment BMPs – All Caltrans-approved Treatment BMPs will be implemented to the MEP. Treatment BMPs may include traction sand traps, infiltration devices, detention devices, biofiltration strips/swales, dry weather flow diversion, media filters, multi-chamber treatment trains, wet basins, and gross solids removal devices.